

5772 Flooring Tiles

You want to decorate your floor with square tiles. You like rectangles. With six square flooring tiles, you can form exactly two unique rectangles that use all of the tiles: 1×6 , and 2×3 (6×1 is considered the same as 1×6 . Likewise, 3×2 is the same as 2×3). You can also form exactly two unique rectangles with four square tiles, using all of the tiles: 1×4 , and 2×2 .

Given an integer N , what is the smallest number of square tiles needed to be able to make exactly N unique rectangles, and no more, using all of the tiles? If $N = 2$, the answer is 4.

Input

There will be several test cases in the input. Each test case will consist of a single line containing a single integer N ($1 \leq N \leq 75$), which represents the number of desired rectangles. The input will end with a line with a single '0'.

Output

For each test case, output a single integer on its own line, representing the smallest number of square flooring tiles needed to be able to form exactly N rectangles, and no more, using all of the tiles. The answer is guaranteed to be at most 10^{18} . Output no extra spaces, and do not separate answers with blank lines.

Sample Input

```
2
16
19
0
```

Sample Output

```
4
840
786432
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